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OF PUBLIC HEALTH

ASSESSMENT OF AVAILABILTIY AND UTLIZATION OF EMERGENCY OBSTETRIC CARE SERVICES IN GAMO GOFFA ZONE, SNNPR, ETHIOPIA

BY

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Acronyms

APH-Ant Partum Hemorrhage

BEmOC - Basic Emergency Obstetric Care

CDR - Crude Death Rate

CEmOC - Comprehensive Emergency Obstetric care

CSA - Central Statistics Agency

EDHS - Ethiopian Demography Health Survey

EmOC - Emergency Obstetric Care

EmONC - Emergency Obstetric and Neonatal Care

ESOG -Ethiopian Society of Obstetricians and Gynecologists

FIGO -International Federation of Gynecology and Obstetrics

MOH -Ministry of Health

NLM- Norwegian Lutheran Mission

PPH- Postpartum Hemorrhage

TRF -Total Fertility Rate

UNFPA - United Nations Population Fund

UNICF - United Nations Children's Fund

WHO - World Health Organization

SPSS – Statistical Package For Social Sciences

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Abstract

Introduction: Most maternal deaths take place during labor and within few weeks after delivery. The availability and utilization of emergency obstetric care facilities is a key factor to reduce maternal mortality. However, there is limited evidence how these institutions perform and how many people utilize them in Gamo Goffa zone, south west, Ethiopia.

Objective: To assess availability and utilization of emergency obstetric care services in Gamo Goffa zone.

Methods: Facility based cross sectional study was conducted among all health facilities (3 hospitals & 63 health centers) that exist in Gamo Goffa. A retrospective review of obstetric services, records, documents, cards and/or registration books of mothers treated and/or served in Gamo Goffa zone health facilities for last one year during data collection. The data collectors visited each facility and observed the records and interviewed head nurses. Data entered to computer based SPSS Version 16 statistical analysis was employed and results were presented and discussed.

Results: There were 3 basic and 2 comprehensive emergency obstetric care facilities per 1,740,885 population. The proportion of births done by skilled attendants in health facilities was 6.6% of all expected births, and the caesarean section rate was 0.8%. The proportion of maternal deaths among births attended in health facilities was 1867/100,000 live births (79/4231). Health facilities that are far from Arbaminch hospital (>50km) had significantly lower number of births than the nearest to the zone (p-value=0.006).

Conclusion: The availability of basic and comp EmOC facilities for 1,704,885 population were far below the recommended by the UN. The proportion of institutional delivery and cesarean section was low.

Recommendations: Improve existing facilities or making fully functional with posting midwives and trained personnel with emergency surgery, provision of blood transfusion services and medical supply, an effective referral system.

1. Introduction

Globally 585,000 annual deaths due to complications of pregnancy &delivery, 99% occur in the developing world. Deaths from maternal causes represent the leading cause of death among women of reproductive age in most developing countries [1]. It is estimated that the highest risks from pregnancy occur in Africa, in particular in Eastern & Western Africa, with ratios over 1000 maternal death per 100,000 live births. In Ethiopia maternal mortality ratio was 673 per 100,000 live births [2, 3].

The fifth Millennium Development Goal is to reduce maternal mortality by 75% between 1990 and 2015. Recent evaluations show that progress has been especially slow in sub-Saharan Africa because of weak health systems, poor quality of care, inadequate human resources, financial barriers to care and insufficient political commitment [4-8]. Investment in maternal health programmes can be tracked by measuring inputs (such as midwifery training), outputs (such as the number of midwives posted) and processes (such as the uptake of skilled delivery care). These indicators are necessary for planning, implementing and monitoring initiatives to improve maternal health. However, there is also a need to show progress in terms of impact: reduced mortality, complications and disabilities, and improved health [7].

Most maternal deaths are avoidable. They are the result of major direct obstetric complications (hemorrhage, uterine rupture, dystocia, and eclampsia) and indirect complications (HIV, malaria) [9]. Most direct obstetric complications can be treated by a package of eight interventions identified by the WHO, UNICEF and UNFPA that are known as emergency obstetric care (EmOC): parenteral antibiotics, parenteral oxytocic drugs, parenteral anticonvulsants for pregnancy-induced hypertension, manual removal of the placenta, removal of retained products of conception, assisted vaginal delivery, surgery (e.g. caesarean delivery) and blood transfusion[10,11].

A project to survey emergency obstetric care in developed and developing countries was launched in 1997 using the United Nations (UN) process indicators as the guidelines. These UN indicators are the number of hospitals that can provide care for emergency obstetric conditions per 500 000 population, the proportion of births in the hospitals, the proportion of women with obstetric complications treated in the hospitals, the caesarean section rate and the case fatality rate.[13]. Emergency obstetric services are available for sometime in the Gamo area and around Arbaminch town. The services have been recently started in the western Goffa areas. Also, some health centers are better staffed than others, and this might also affect the outcome of EmOC services.

RATIONALE OF THE STUDY

Ethiopia's current situation calls for using cost-effective and simpler approaches to urgently established critical and currently valid baselines that would form the basis for evaluation of progress in the nearest future, as well as provide appropriate foundation for evidence-based policy and programmed actions. Thus, the use of process indicators relating to EOC has become a highly recommended approach to monitoring progress in maternal mortality reduction efforts.

The purpose of this study was to assess availability, accessibility and utilization of emergency obstetric care service using the process indicators in Gamo Goffa zone health facilities. Analysis of these indicators provides useful keys to problems requiring attention if maternal mortality reduction is to progress. In south-west Ethiopia specifically Gamo Goffa zone was not studied, and thus data concerning the indicated process indicators were not collected.

The results may be used by program managers and stakeholders in the planning and implementation of interventions to scale up maternal survival and quality of life and to allow them to adequately assess the health service situation.

2. Literature review

Maternal Mortality has been given due emphasis on the MDGs for its reduction by ¾ by the year 2015. This indicates the need to acquire reliable baseline information for monitoring progress. Several approaches have been adapted to acquire reliable data on maternal deaths.[3,4]

The two components of Essential Obstetric Care are the Basic Emergency Obstetric Care (BEOC) that is (performance of life saving obstetric functions including parentral antibiotics, oxytocic drugs, sedatives for eclampsia, manual removal of retained products and basic neonatal life support) and the Comprehensive Essential Obstetric Care (CEOC) (all those in BEOC plus obstetric surgery, anesthesia and blood transfusion)[13].

The availability of services, the functionality and utilization are important aspects of the strategy. Assessment of utilization of EOS in north Shoa and Gondar has indicated that institutional delivery is very low in the region. Different reasons were identified regarding underutilization of obstetric services. The studies indicate that most women delivery at home. In urban areas there exists a different scenario. In the capital Addis Ababa the institutional delivery rate is 78.5%, which is much higher, compared to the regions. [14].

The HSDP – III Strategic Plan for Ethiopia stated a goal of achieving comprehensive EmONC in 87% of its hospitals and in 20% of its health centers by 2010. The goal also included the upgrading of health centers so that 100% provide basic EmONC. The assessment data show that as of 2008 these goals were far from being met: only 51% of hospitals qualified as comprehensive and only 1% of health centers, or 25 could be considered basic EmONC. Several signal functions were often missing: blood transfusion, parenteral anticonvulsants, assisted vaginal delivery with vacuum extraction or forceps, and neonatal resuscitation, and many facilities were missing equipment [15].

Process indicator is one of the critical pathways to reduce maternal mortality in improving the accessibility, utilization and quality of services for the treatment of complications during pregnancy and childbirth. At least 15 per cent of all pregnant women develop serious complications that are often unpredictable and require life-saving access to quality obstetric services. However, there are virtually no data on the proportion of women with access to such care. One indicator that tries to capture such access is the proportion of pregnant women who deliver with the assistance of a skilled birth attendant [13].

Similar studies in three African countries (Tanzania, Rwanda and Ethiopia) show that availability and utilization of EmOC increased in Tanzania; the met need for EmOC increased slightly from 14% in year 1 to 19% in year 4, while in Rwanda it increased from 16% to 25% over 4 years. Case fatality rates (CFR) declined by 30-50% in all 3 countries. While still well below UN recommendations, in all three countries there was also a progressive increase in the cesarean section rates, a life saving obstetric intervention. The increases in met need and decreases in case fatality suggest that project interventions improved the quality and use of EmOC, a critical component for saving women's lives[16].

The others important indicators include the number of facilities with emergency obstetric services. According to the UN recommendations, there should be at least one comprehensive and four basic EmOC facilities per 500,000 populations. These should also be accompanied by adequate number of births in those facilities treating most obstetric emergencies. An estimated 15% of pregnant women develop major direct obstetric complications that require medical care, so the recommendation is that at least 15% of births should take place in EmOC. This is estimated through the met obstetric need (MON) which is an indicator for the interventions conducted for those with absolute maternal indications should be 100% with the expectation that all women are in need of major intervention

gets it from the health system. The case fatality rate (CFR), which is the proportion of women with obstetric complications, admitted to a facility that dies should not be above 1% [1, 17].

FIGO Save the Mothers Fund was to establish basic and comprehensive emergency obstetric care (EmOC) with the specific objectives of increasing the availability and utilization of quality obstetric care as measured by the UN indicators. As a result of this commitment, by FIGO, the Ethiopian Society of Obstetricians and Gynecologists (ESOG) launched the Save the Mothers Project (SMP) in West Showa Zone (WSZ), in Ethiopia in 1998 to implement and test a demonstration project and evaluate the feasibility and impact of the intervention. The overall objectives matched FIGO's—reducing maternal deaths by promoting the availability, access and utilization of EmOC services for women with complications of pregnancy and childbirth [18].

Causes of maternal deaths usually vary in different settings. Worldwide, hemorrhage, sepsis, hypertensive disorders, obstructed labour, and unsafe abortion account for about 80% of maternal deaths (23). More or less similar findings were observed in the four districts of West Bengal, where major obstetric complications were responsible for 85.7% of maternal deaths in the health facilities, which is almost consistent with another report in West Bengal but higher than the proportion (76.77%) in Bangladesh [19].

Other study in Malawi showed met need was only 18.5%; cesarean delivery rate was less than 3%. The case fatality rate was 3.4% indicating poor quality of care, attributable partly to absence of skilled birth attendants and motivated staff, and the frequent shortage of drugs and medical supplies. Consequently, the Malawi Road Map for accelerating improvement was developed through multidonor and multisector collaboration with the Reproductive Health Unit of the Ministry of Health. This Road Map is now being implemented in all districts of Malawi [21].

Distance to health services exerts a dual influence on use, as disincentive to seeking care in the first place and as an actual obstacle to reaching care after a decision has been made to seek it [22]. Many pregnant women do not even attempt to reach a facility for delivery since walking many kilometres is difficult in labour and impossible if labour starts at night, and transport means are often unavailable. Those trying to reach a far-off facility often fail, and women with serious complications may die en route[22].

3. Objective

3.1. General Objective

- To assess the availability and utilization of emergency obstetric care services in Gamo Goffa zone, SNNPR, 2011.

3.2. Specific Objectives

- To describe the availability of EmOC services in Gamo Goffa zone health facilities.
- To describe the utilization of EmOC services in Gamo Goffa zone health facilities.
- To identify factors associated with EmOC services outcomes at health institutions in Gamo Goffa zone.

4. Methods

4.1. Study design

Facility based cross sectional study was conducted among all health facility, a retrospective review of obstetric services, records, documents, cards and/or registration books of mothers treated and/or served in Gamo Goffa zone health facilities for the last one year. As per WHO guideline recommendation all the sixty six facilities were included [13].

4.2. Study setting

The study was conducted in Gamo Goffa zone. Out of 1.7 million population, 1.5 million (90.1%) are live in the rural areas and the remaining are living in the urban. It has 15 woredas and 2 towns. There are 3 hospitals, 30 higher health centers and 33 upgrading health centers in the zone. The study was conducted starting from data collection through final dissemination (from Nov 2010 to June 2011).

4.3. Source population

All public health facilities (hospital, upgrade &high health center) in Gamo Goffa zone.

4.4. Sample population

3 hospitals, 30 higher health centers and 33 upgrading (medium) health centers.

4.5. Sample size and sampling techniques

For evaluation of emergency obstetric care performances, World Health Organization (WHO) manual (references) recommends the use of all health institutions in the area if there are less than 100 in number [13].Therefore; all 66 health institutions found in the zone were included in the study. Since the number of health facilities is less than 100, it become convenient and feasible to include all health facilities that provide obstetric services (63 Health Centers and three Hospitals).

4.6. **Data collection**

Data were collected using questionnaires developed jointly by WHO,UNICEF,UNFPA or UN guidelines predominantly through review of the available records and registers of the facilities (e.g. admission register, maternity register, delivery log book, referral register, death register, etc.). Each of data collectors was visited all facilities and observed documents, records, etc and Key health officials and members of staff at the facilities were also interviewed for clarification of any recorded data, if required.

Data collectors were 3rd year accelerated health officer students and trained for three days. The training focused on explanation of EmOC facility, filling the format, getting clarification on records whenever important information was missed from the records. The formats then were pre tested in two health centers where the clarity and appropriateness was tested and modified accordingly. The data were collected from Jan 5/2010 up to February 25/2011.

4.7. **Data quality control**

For consistency and quality assurance, the data were collected from multiple registers/records and simultaneously cross-checked and supervised. Also quality of the data was assured through 3 days of refresher training for the data collectors and supervisors was given to check on the subsequent data collection days. The supervisors and principal investigator collected the filled formats and checked them for completeness, consistency and clarity. There was information bias in one health center and we checked that health center, there is a great gap or misreported.

Double entry of data was done to ensure the data quality in SPSS 16 version, coding and data cleaning was done (check frequencies and cross-tab for each item).

4.8. **Data analysis**

Data analysis was done by using SPSS, window versions 16 statistical program. The data were cleaned again for inconsistencies and missing values. After categorizing and defining variables descriptive statistical tests were carried out for availability and outcome of EmOC and its association to predisposing factors to outcome of EMOC was calculated. For each variables frequencies, proportion, and also use bivariate and multivariate analysis was fitted for variable that had association at 20% were entered into multiple linear regression. Multivariate analysis was computed to control the effect of confounders.

4.9. **Variables of the study**

Dependent variables

- EmOC service availability
- Outcome of EmOC services (number of delivery, maternal death)

Independent variables

- Access to EmOC facilities
- Geographical area, road
- Human resources (midwives, nurses, health officer etc.)
- Availability of equipment and materials

4.10. **Operational definitions**

- **Maternal Death**: the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

- **Emergency obstetric care** _ refers to care provided in health facilities to treat direct obstetric emergencies that cause the vast majority of maternal deaths during pregnancy, at delivery and during the postpartum period.
- **Basic Emergency Obstetric Care** – refers to lifesaving services for maternal complication being provided by a health facility or professional which must include the following six signal functions: administration of parenteral antibiotics; administration of parenteral oxytocic drugs; administration of parenteral anticonvulsants for pre-eclampsia and eclampsia; manual removal of placenta; and assisted vaginal delivery.
- **Comprehensive Emergency Obstetric Care** – refers to basic emergency obstetric care plus two other signal functions: performance of caesarean section and blood transfusion.
- **EmOC facility**: refers to whether a facility is fully functioning as either a basic or comprehensive facility. Functioning is defined by nine signal function.
- **None EmOC facility**: A health facility that has performed none of the signal functions in the last three months or 12 months.
- **Availability of EmOC services**: basic emergency obstetric care (BEmOC) and comprehensive emergency obstetric care (CEmOC) providing lifesaving obstetric procedures including surgery. The UN Guidelines suggest minimum acceptable levels: there should be one facility providing CEmOC; and four facilities providing BEmOC for every 500 000 populations.
- **Utilization of EmOC services**: are enough women and women with obstetric complications using EmOC facilities.
- **Accessibility of EmOC facility**: Geographical distribution of EmOC (appropriate location of facility, distance, time…..)

5. **Ethical consideration**

Ethical clearance was obtained from University of Gondar. Official letter from University of Gondar and Addis Continental Institute of Public Health was presented to Gamo Goffa zone health facilities, to obtain cooperation. After getting ethical clearance, written permission was obtained from Gamo Goffa zone health department and woreda health authorities through a detailed explanation of the purpose of the study.

Repeated explanations were given for the respective leaders of each health facility.

Finally, a written consent was obtained from head of each facility after clear explanation of the purpose of the study.

6. Results

Availability of EmOC

Of the 66 facilities, 4.5% (3) health facilities provided basic EmOC services and 3% (2) health facilities provided comprehensive EmOC per 1,740,885 population and 92.4% (61) health facilities do not provide EmOC.(see table 1)

Table-1: Availability of EmOC Facility, Gamo Goffa Zone, SNNPR, July 2009 to June 2010(2002 Eth budget year).

Districts (Woreda)	**Population size in 2002E.C**	**Available Basic EmOC per 500,000 pop**	**Available Comp EmOC per 500,000 pop**	**Available none EmOC facilities**
Kemba	169756	1(1:169756)		6
Zala	80931			5
Chencha	122193	1(1:22193)		4
Melokoza	131009	1(1:31009)		4
Oyida	36187			1
GezeGoffa	74951			3
Bonke	173240			5
Uba debre tsehay	75377			3
Daramalo	88232			2
Dita	91433			4
Arbaminch zuria	178740			4
Merab Abaya	81819			4
Boreda	74008			4
Kucha	162513			6
Deniba Goffa	88176			3
Gamo Goffa Zone	1,740885	3(1:580295)	2(1:870442)	61

Note: Gamo Goffa zone: 2(1:870442) the two hospitals (Arbaminch and Sawula) Exclude from the table b/c serving for all population in zone as referral facilities.

As for access to referral services 57.6% (38/66) of facilities were in a distance far beyond 50km from a referral hospital/nearest hospital providing comp EmOC. Overall, 4(6.1%) of the facilities had access to asphalt road, 21(31.8%) of facilities had all weather road and 30(45.5%) had access to only dry season road and 11(16.7%) cannot be accessed by a vehicle.

Three percent (2) facilities were provided all signal function determined to be fully functioning and 92.4% (61) facilities were missing anywhere b/n 1 & 9 signal function determined to be partially functioning, 24. 2% (16/66) facilities were missing at least 3 or 4 of the signal functions and 60.6% (40/66) were missing more than 5 of the signal functions. Among all facilities, the survey showed that, 54.5 % (36/66) had performed parenteral antibiotics in the last 3 months 92.4% (61/66) had performed assisted vaginal delivery, 71. 2% (47/66) had performed manual removal of placenta and 34.8% (23/66) & 21.2% (14/66) had performed parenteral oxytocin & anticonvulsants.(see figure 1)

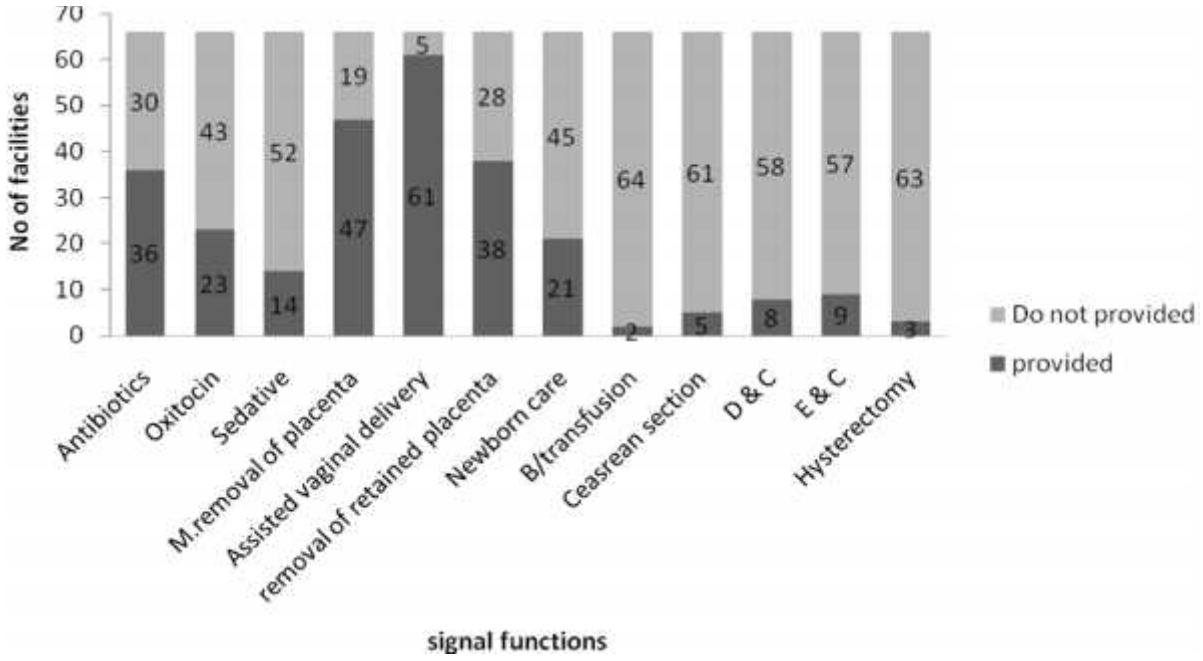

Figure 1: Signal Functions Provided at All Health Facilities, Gamo Goffa zone, SNNPR, in the last 3 month (before data collection).

Proportions of births in all facilities and caesarean section

The study findings showed that 6.6% of all births occurred in health facilities, but the gap between woredas was wide: in Lower Denba Goffa, the proportion of births in EmOC facilities was 0.64%, while in Merab Abaya, the proportion was 9.5%, better than the zone average. (See table 2). Caesarean section was performed in only 0.81% of all expected birth in the population and 12.3% of all births in the facilities.

Table 2. Proportion of Births in All Health Facilities, Gamo Goffa zone, SNNPR, July 2002 to June 2010(2002 Eth budget year).

Districts (Woreda)	**Population in 2002E.C**	**Expected number of births(annual)**	**Proportion of institutional delivery (%)**
Melokoza	131009	4847	102(2.1)
Denba Goffa	88176	3263	21(0.64)
Kucha	162513	6013	108(1.8)
Boreda	74008	2738	30(1.1)
Merab Abaya	81819	3027	287(9.5)
Arbaminch zuria	178740	6613	273(4.1)
Chencha	122193	4521	409(9.1)
Dita	91433	3383	163(4.8)
Daramalo	88232	3265	54(1.7)
Zala	80931	2994	58(1.9)
Uba debre tsehay	75377	2789	37(1.3)
Kemba	169756	6281	411(6.5)
Bonke	173240	6410	276(4.3)
Geze Goffa	74901	2773	56(2)
Oyida	36187	1339	14(1.1)

Gamo Goffa Zone	1740885	64413	4231(6.6)

Proportion of maternal deaths and complications

In all the health facilities 24.3% (1031/4231) of complicated cases found and proportion of maternal deaths among births attended in health facilities was 1867/100,000 live births (79/4231). The survey result showed that the postpartum hemorrhage, obstructed labor and postpartum sepsis were the most common causes of maternal deaths, accounting together for 69.6% of all deaths recorded in these facilities (55/79). See the figure

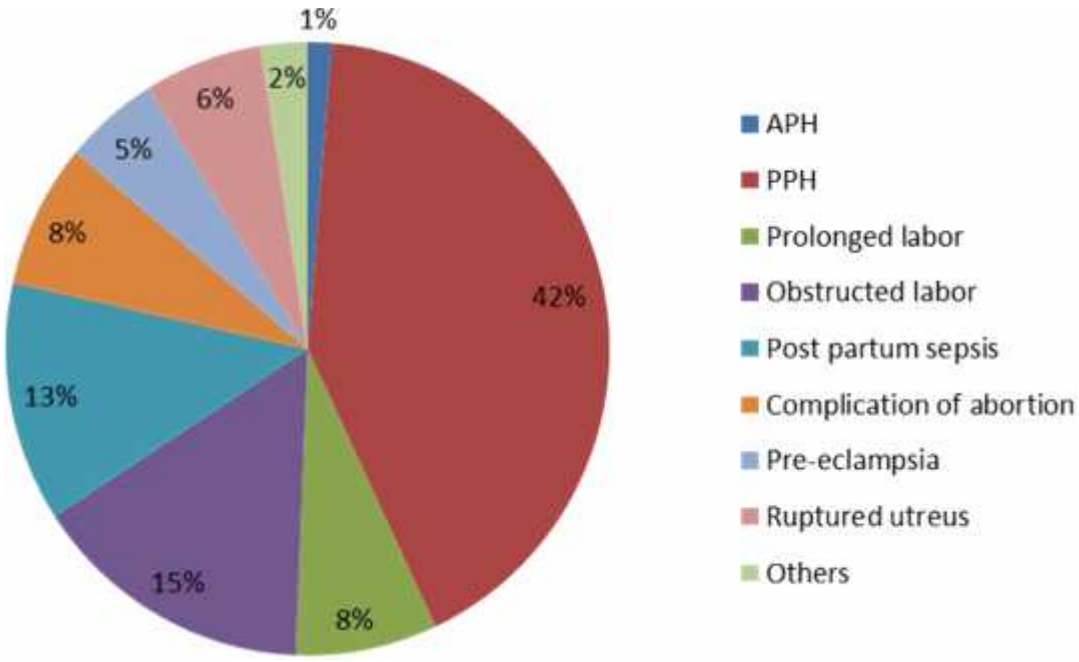

Fig 2. Causes of maternal deaths in all health facilities in Gamo Goffa zone, SNNPR, July 2009 to June 2010(2002 Eth budget year).

Intrapartum and very early neonatal death rates: This is the proportion of births that result in an intrapartum death (stillbirth) or a very early neonatal death (< 24 hours); the study showed that 42 per 1000 still birth rate and 2 per 1000 early neonatal death rate in all facilities.

Type of facility where women with complications were treated

Of the 66 facilities 38(57.6%) health centers are more than 50 km from the first referral level. Majority of the referred mothers had to travel long distances to reach the nearest first referral level. Five facilities have an operating theatre and 61 facilities refer to another hospital when obstetric surgery is indicated. Approximately 63.4% (276) of women with direct obstetric complications admitted at health centers were referred to the next level health facility. (See Figure2)

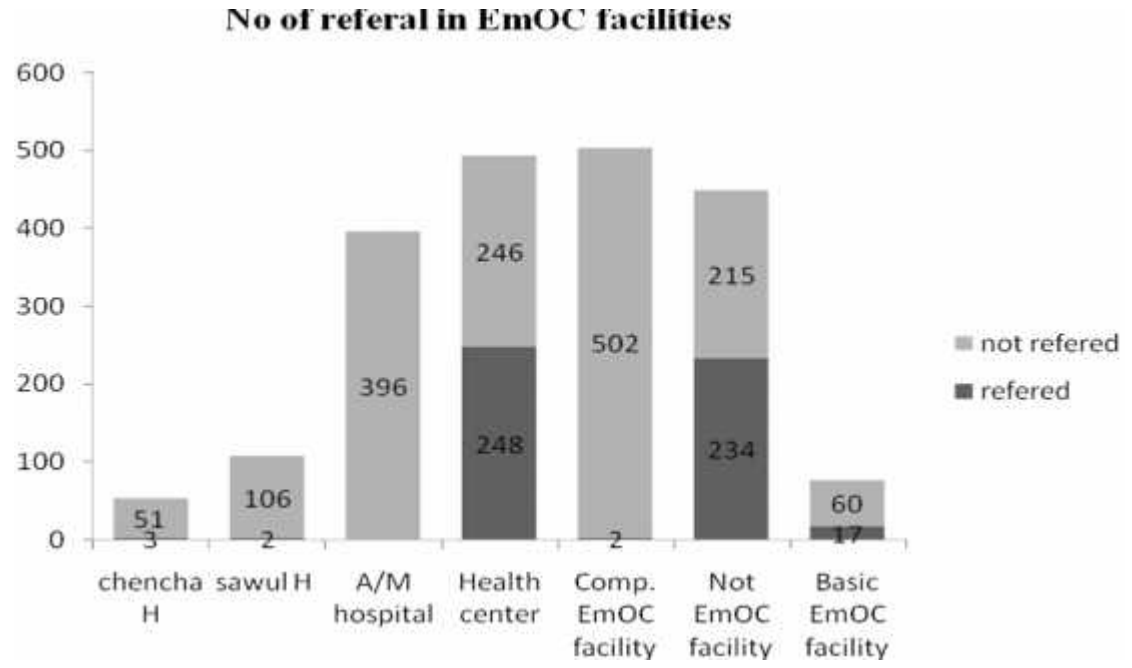

Figure 3. Number of Direct Obstetric Complications Referred out, By Type of Facility, Gamo Goffa Zone, SNNPR, July 2009 to June 2010(2002 Eth budget year).

Determinants of EmOC Outcome

The outcome of EmOC is utilization of EmOC services such as number of delivery, maternal death and stillbirth. By applying bivariate analysis for dependent variable (number of delivery) and independent variables (distance from zone, type of facility, road type and number of midwife) that had significant at 0.2% P-value had entered to multiple linear regression. Health facilities that are far from the zone (>50km) have lower number of birth than the nearest to Arbaminch hospital i.e. is served as referral hospital for zone (P-value = 0.006). Similarly, health facilities that have higher number of midwife were more likely to have birth than health facilities that have lower number of midwife (P-value = 0.001). Although the type of facility and road type were identified to have an effect on the number of birth with in the facilities (P-value = 0.905) and (P-value = 0.706) respectively. However, in this study, both types of facilities and the road type did not show statistically significant association with the number of delivery when they were entered into the multiple linear regression model (see table 4).

Table 3: Result of Bivariate And multivariate Analysis of variables that are association with Number of Delivery, Gamo Goffa zone, SNNPR, July 2009 to June 2010 (2002 Eth budget year).

Bivariate analysis				**Multivariate analysis**	
Variable	**COR**	**95%CI**	**P-value**	**AOR (95% CI)**	**P-value**
Road type	4.301	40.423,59.024	0.706		
Distance from zone	0.457	0.790, 0.124	0.009	0.433(0.730,0.135)	**0.006**
Type of facility	3.452	62.096,55.193	0.905		
Number of midwife	119.390	94.477,144.304	0.000	116.930 (99.408,134.452)	**0.0001**

7 .Discussion

The numbers of both basic and comprehensive EmOC facilities for every 500,000 population were 4 and 1, respectively, UN minimum recommendation [13]. Based on the total population (1,740,885) and the recommended criteria, there should have been 14 basic and 4 comprehensive EmOC facilities in the zone. This study found that 3 basic and 2 comprehensive EmOC facilities that were inadequate and below UN minimum recommendations. Studies in other countries have found that comprehensive EmOC facilities, but not basic EmOC facilities, tend to be numerically adequate in relation to population [17, 18]. A possible explanation is that the concept of basic emergency obstetric care is relatively new and these services have not yet been given priority within the health system.

Gamo Goffa zone show concerted efforts at increasing access to basic EmOC facilities and at improving existing facilities, because many obstetric complications can be managed at the EmOC facilities.

Although 24.2 % of facilities were missing at least 3 or 4 of the signal functions and 60.6% were missing more than 5 of the signal functions. This could be due to there were no trained staff, or the necessary supplies (drug, lack of blood transfusion, resuscitation bag etc.) were not available when needed and could be no patients presented needing the procedure. Similarly studies done in Malawi show that signal functions most frequently not done at the 94 health centers and the same reason with this study in addition to that no trained staff to carry out such procedures.

In terms of utilization of services, 6.6% of all expected deliveries occur in all facilities. Compared with the standard set by the UN Guidelines shows that the desired minimum of 15% of deliveries at EmOC facilities of expected deliveries are therefore low. This disparity is could be due to long distance to reach health facilities and in addition to this social and cultural restriction that induce women in some areas to give birth at home.

Caesarean delivery, UN process indicators recommend that at least 5% of births be undertaken by caesarean section, and keeping in mind the overuse of this technique, no more than 15%. This finding shows that 0.81% of expected birth in the population and 12.3% of all births in the facilities. This is below the recommended minimum of 5% Caesarean section.

Studies in the states of Gujrat and Maharastra also reported a low rates of 0.82% and 2% of caesarean sections respectively **(**20**).**The small proportions of births by caesarean section in all the districts that indicating many women were not receiving the emergency care they need. This could be due to there were no trained staff, or the necessary supplies (drug, lack of blood transfusion, equipment etc.) were not available when needed.

In all facilities 24.3% (1031/4231 of major/direct obstetric complications and proportion of maternal deaths among births attended in health facilities was 1867/100,000 live births (79/4231) or 1.9% (79/4231) of proportion of maternal deaths were found in this study, more than the acceptable level of 1%. This was similar when compare with the study done in Bangladesh, the proportion of estimated obstetric complications is 26.5% and 1.7% of proportion of maternal deaths in Malawi (19, 20). A high proportion of estimated obstetric complications and less proportion of complications managed at all health facilities may possibly indicate at least two aspects: non-existence of an appropriate referral system, and lack of trained personnel in some procedures, absence of skilled birth attendants and also due to the facilities are located at far distance and the road is not accessible.

In this assessment, it was observed that record keeping was generally poor and that maternal deaths were not routinely recorded in all facilities.

The number of midwife available in the health facilities was related to the number of birth in health facilities. Compared to other studies done in low and middle-income countries revealed that many women reported dissatisfaction with rude and neglectful behavior at health facilities and prefer the care of a midwife or relative [22]. Another possible explanation for this is that women pregnant with their first child were more cautious about their pregnancies and, therefore, sought out trained professionals.

Distance from the zone is an important predictor for the birth in the health facilities in this study. In general, health facilities that are far from the zone were less likely to have birth as compared to the facilities nearest to the zone. This result is consistent with previous studies in low and middle income countries. Distance to health services exerts a dual influence on use, as a disincentive to seeking care in the first place and as an actual obstacle to reaching care after a decision has been made to seek it [22].

Many pregnant women do not even attempt to reach a facility for delivery since walking many kilometers is very difficult in labour and impossible if labour starts at night, and transport means are often unavailable as well as have no car road access. Those trying to reach a far-off facility often fail, and women with serious complications may die en route and the obstacle effect of distance is stronger when combined with lack of transport and poor roads, and its disincentive effect is less pronounced if women have serious complications.

Strength of the study

- All facilities in Gamo Goffa zone were included in the study, this avoid sampling error.
- Though this study has a limitation, it still provides more reliable on local EmOC services than any estimation that is based on data from other country.
- There is inadequate data in EmOC services our setup, so this finding used as baseline data for planning and implementation of activities.

Limitation of the study

- Facility records of deliveries complication and deaths are often incomplete. Deaths in particular can be omitted.
- These assessments mainly looked at the availability and utilization. However, there is not enough information properly to elucidate why women use & do not use EmOC service.
- No similar study so far in our country & lack of literature in our country for comparison.
- There may be information bias during recording of information from registration books.

8. Conclusion

- In the study area the availability of basic and comprehensive EmOC facilities generally falls below the accepted standard for the number of BEmOC facilities required for the available population. The challenge in many cases is not that of establishing new facilities, though that cannot be ruled out entirely in certain circumstances and places. Rather, the more immediate challenge is that of improving the standard of available services (with appropriate focus on human resource development and provision of equipment, supplies and other facilities) to enable the existing facilities be able to perform the signal functions that would enable them meet EOC standard.

- The utilization of EmOC services, that is, proportion of institutional delivery and CS was very low.

- Distance from the zone and number of midwives had a significant statistical association with the number of institutional delivery.

- Institutional Proportion of maternal deaths in health inst. and major/direct obstetric/ complications were high, factors including lack of blood transfusion, shortage of essential drugs (particularly Magnesium Sulphate) and poor referral system shortage of doctors contributed to develop complication deaths.

9. Recommendation

- **For Policy makers and Program managers:**

- Improve and utilize the Emergency Obstetric Care Guidelines for monitoring and evaluation of the provision of health care in resource poor settings.
- Strengthen the referral system to shorten the first and second delays.

- **For the Health Institutions:**

- Improve availability of qualified Emergency Obstetric Care facilities, either through improve quality of existing services or provision of equipment and supplies.
- Improve recording procedure of EmOC services (complications and deaths at delivery) to facilitate effective monitoring.
- Mothers, their families, and communities should be informed of the major obstetric danger signs.

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11. Annexes

Annex: 1. Conceptual frame work

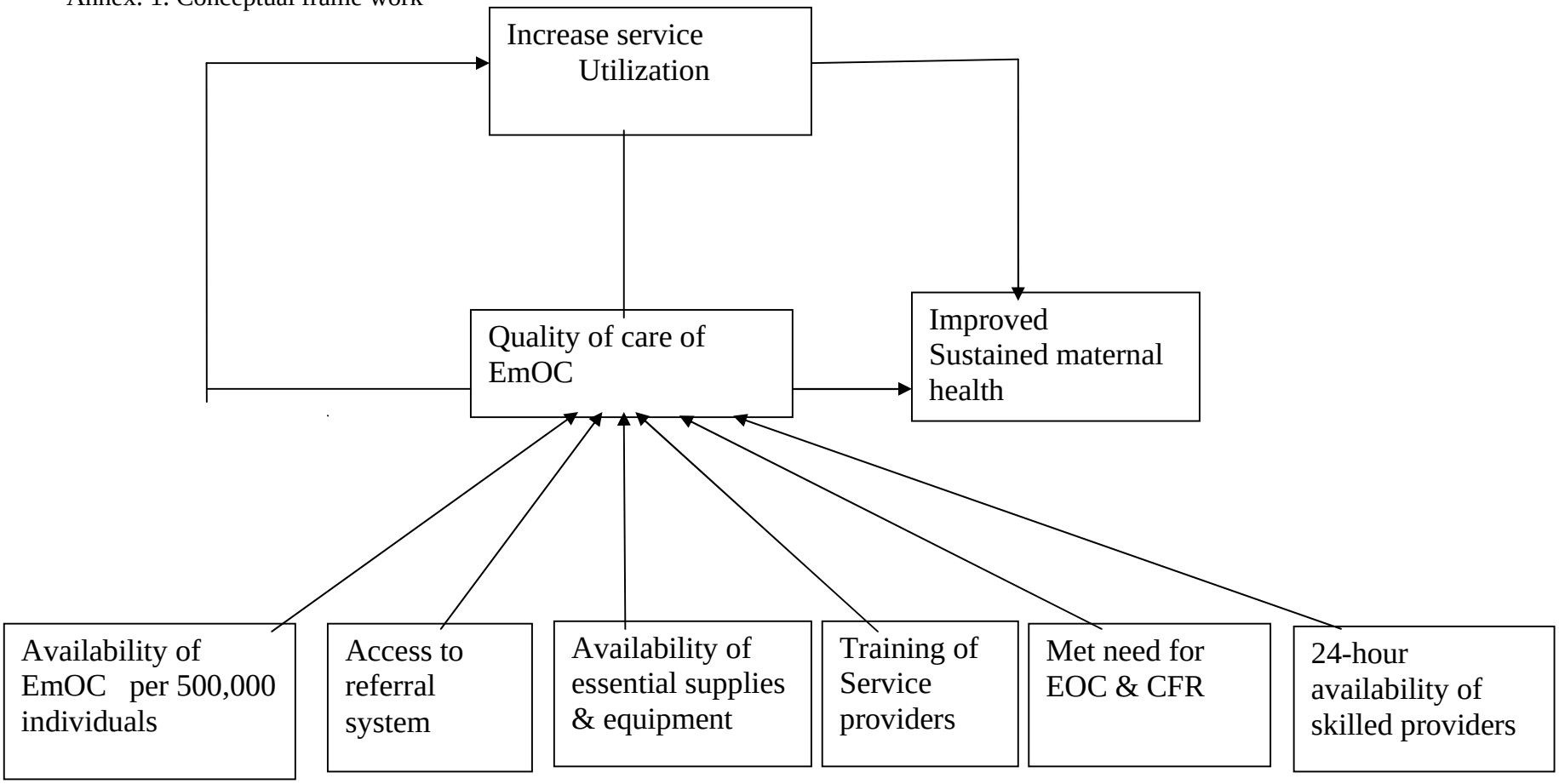

Figure: 3 A modified frameworks showing the different factors affecting EmOC services [24].

Annex 2: Consent form

Hospitals& health centers were selected for the study of Assessment of Availability and Utilization of emergency obstetric care services in Gamo Goffa zone, 2011. The study was conducted from January 15/2011 up to February 4/2011. The researcher would therefore like to collect the data in the Obstetric Unit of the Hospital, Statistics unit & from other relevant documents. The purpose of the study is to develop a Masters thesis as a requirement for the degree of Master of Public health in the Department of Community Health, Addis Continental Joint MPH Program, and Gonder University. The finding of this operational baseline research may help improve program implementations and future monitoring.

The summary of the results of the study will be reported to the Hospitals and health centers who participated in the study. The researcher would like to assure you that all of your responses to our questions will be kept confidential throughout the study process. We therefore request your consent and full cooperation throughout the data collection period.

Hospital Representative

Name…….

Signature……

Principal investigator

Meseret Girma

Annex 3: Questionnaire

A Format for Data Collection for a survey on Assessment of Availability, accessibility and Utilization of Emergency obstetric care service in Gamo Goffa Zone 2010.

1. Name of facilities_____Woreda_____

1.1 Facilities type 1. hospital 2. high health center 3. upgrade health center
4. others_____

1.2 Distance from 1. woreda center_____Km
2. Zone center_____Km
3. from the nearest hospital_____Km
4. from the nearest all-weather road_____KM

1.3 Car road access 1. Asphalt 2. All whether road 3. Dry whether road
4. No car road access

1.4 Facilities status_____1. Comp EOC 2. Basic EOC 3. Not EOC

1.5 Functional status of the EOC facility is:

1. Fully functioning 2. Partially functioning 3. Not functioning

2. Were the following services performed at least once during the last 3 months & 12 months?

No	Items		last 3 month	Last 12 month	(If yes)Are medicines/equipments available today	If not performed in past 3 months, why?
2.1	Parentral antibiotics		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.2	Parentral oxytocin		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.3	Parentral sedatives		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.4	Manual removal of placenta		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.5	Removal of retained product		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.6	Assisted vaginal delivery		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.7	Perform newborn resuscitation (e.g. with bag and mask)		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.8	Blood transfusion		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.9	Caesarean section		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
2.10	Others(currtage	D &C	€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
		E& C	€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	
	Hysterectomy….		€ 1.Yes € 2.No	€ 1.Yes € 2.No	€ 1.Yes € 2.No	

If not performed in past 3 months,(if "NO"" why?

1. Training issues 2. Supplies, equipment, drugs issue 3. Management issue

4. Policy issues 5. No indication

3. For each health facilities

No	Types of services	(Hamle 2001_ Sene 2002 E.C)	(Hamle 2000 – sene 2001 E.C)	(Hamle 1999– sene 2000E.C)
3.1	Catchment population			
3.2	Expected number of delivery from catchment popn			
3.3	No of births took place			
3.4	No of normal vaginal dellivey			
3.5	Caesarean section performed			
3.6	No of total maternal deaths			
3.7	No of still birth			
3.8	No of early neonatal death			
3.9	No of referral			

4. Number of clinical staffs working in obstetrics

No	Staffs		During the last 3 month	(Hamle 2001-Sene2002E.C)	Is there 24hrs services? (Yes/No)
4.1	Doctors(specialist)				
4.2	Doctors GP				
4.3	Health officers				
4.4	Nurse	Bsc			
		Diploma			
4.5	Midwives	Bsc			
		Diploma			
4.6	Anesthetics nurse				
	Total				

5. Complicated **obstetric cases** during 12 month period(2002E.C only). Hamle 2001E.C_Sene 2002E,C)

S.No	Complicated obstetric cases	Months											Total
		Hamele 2001	Nehase	Meskerm 2002	Tikimt	Hidar	Tahisas	Yekatit	Megabit	Meyazya	Ginbot	Sene 2002	
5.1	Hemorrhage(APH&PPH)												
5.2	Hemorrhage(PPH)												
5.3	Prolonged labor												
5.4	obstructed labor												
5.5	Post partum sepsis												
5.6	Complication of abortion												
5.7	Pre –eclampsia or Eclampsia												
5.8	Ectopic pregnancy												
5.9	Ruptured uterus												
5.1	Others												

6. **Maternal deaths** from complicated obstetric cases during 12 month period (2002E.C only). Hamle 2001 E.C_Sene 2002E,C)

S.No	Maternal death from each complication of obstetric cases	Months											Total
		Hamele 2001	Nehase	Meskerm 2002	Tikimt	Hidar	Tahisas	Yekatit	Megabit	Meyazya	Ginbot	Sene 2002	
6.1	Hemorrhage(APH)												
6.2	Hemorrhage(PPH)												
6.3	Prolonged labor												
6.4	obstructed labor												
6.5	Post partum sepsis												
6.6	Complication of abortion												
6.7	Pre –eclampsia or Eclampsia												
6.8	Ectopic pregnancy												
6.9	Ruptured uterus												
6.10	Others												

7. What sources of data were used to complete this form ?

a. maternal ward register b. delivery book

c. general admission register d. operating theatre register

e. others_____

8. In your opinion (from taking to staff, the record system etc), what proportion of the complication treated in this facility is recorded on this form?

a. none b. some(less than half) c. most(more than half) d. all

9. In your informed opinion (from talking to staff, looking at the record system, etc.), what proportion of the maternal deaths that occurred in the facility is recorded on this form?

a. none b. some c. most d. all

10. Date of review_____

11. Reviewed by:

Name_____Sign._____

Thank you very much for your corporation!

የስምምነት ደብዳቤ

<u>ለምርምር መረጃ እንድትሰጡ ስለመጠየቅ</u>

በጋሞ ጎፋ ዞን ውስጥ ባሉት ሁሉም ጤና ጣቢያች እና ሆስፒታሎች ከወሊድ ጋር የተያያዙ መረጃ-ችን ለማጥናት ይህም ጥናት ድንገተኛ ከወሊድ ጋር የተያያዙ ችግሮች እንዲሁም በጤና ድርጅቶች ውስጥ አየተሰሩ ያሉትን አገልግሎቶችና፤ የማይሰሩትን በጤና ድርጅቶች ያሉትን ጉድለቶችን ለማጥናት ስለተፈለገ፤ የጋሞ ጎፋ ዞን ጤና መምሪያ በቁጥር ጋጎጤ1/487/35 በቀን 7/12/2002ዓ.ም በተጻፈ ደብዳቤ መሰረት ወ/ሪት መሰረት ግርማ በአድስ ኮንትነንተልና ከጎንደር ዩኒቨርስቲ ጋር የማስትርስ፤ (ለ2ኛ ዲግሪ) መመረቂያ ጽሁፍ ለሚሰሩት ምርምር በወረዳችን ባሉት ሁሉም ጤና ጣቢያች ከወሊድ ጋር የተያያዙ መረጃችን ማግኘት እንዲችሉ ትብብር እንድታደርጉልን እየጠየቅን የጥናቱን ምላሽ እንደምናሳውቅ እንገልጻለን፡፡

በመሆኑም መረጃዉን ለመሰብሰብ ለሚሄደዉ ሰብሳቢ -------መረጃዉንና መዛግብትን ጭምር በትክክል በማሣየትና በማስረዳት ትብብር እንድታደርጉ እናሳስባለን፡፡

መረጃ የሰጠው ሰው (የድርጅቱ ኀላፊ)

ስም----------

ፊርማ----------

የሥራ ኀላፊነት----------

ጥናቱን የሚያካሂው

መሰረት ግርማ

ስለትብብሩ እናመሰግናለን

በአዲስ ኮንትነኪተል ማስተርስ ፕሮግራም ከጎንደር ዩኒቨርስቲ ህክምና ፋኩልቲ በህብረተሰብ ጤና ትምህርት ክፍል ፡

በጋሞ ጎፋ ዞን ባሉት ሆስፒታል ዉስጥ እና እየተሰሩ ያሉትን ስለድንገተኛ ከወሊድ ጋር በተያያዙ የሚከተሉትን ችግሮች ለማጥናት የተዘጋጀ መጠየቅ፡

1. የጤና ድርጅት ስም ----------ወረዳ----------

1.1. የተቋሙ ዓይነት ወይንም አገልግሎት አሰጣጥ ደረጃዉ

ሀ. ሆስፒታል ለ. ያደጉ ጤና አጠባበቅ ጣቢያ

ሐ. ታዳጊ ጤና ጣቢያ ሲሆኑ መጠየቅ ያለብን የመንግስት ጤና ድርጅቶች ብቻ ይመለከታል፡

1.2. የጤና ድርጅቱ ርቀት በኪ.ሜትር

ሀ. ከወረዳዉ ከተማ ያለበት ርቀት----------ኪ.ሜ

ለ. ከዞን ከተማ ያለበት ርቀት----------ኪ.ሜ

ሐ. በቅርበት ከለዉ ሆስፒታል ያለበት ርቀት----------ኪ.ሜ

መ. በቅርበት ከሚገኝ ፒስታ መንገድ ያለው ርቀት----------ኪ.ሜ

1.3 የመኪና መንገድ አመቺነት ወደ ጤና ድርጅት ለማምጣትም ሆነ ወደ ከፍተኛ የጤና ድርጅት ለመላክ ያለዉን የመንገድ ሁኔተ፤

ሀ. አስፋሊት ነዉ ለ.ፒስታ ሆኖ በማንኛዉም ሰዓት መኪና ይገባል

ሐ. በበጋ ጊዜ ብቻ መኪና ይገባል መ. ጭራሽ የመኪና መንገድ የለም

1.4 ተቋሙ የሚሰጣቸዉ አገልግሎቶች

ሀ. አጠቃላይ ድንገተኛና የወሊድ አገልግሎት

ለ. መሠረታዊ የድንገተኛና የወሊድ አገልግሎት

2. የሚከተሉት አገልግሎቶች ባለፈዉ ሶስት ወር ዉስጥ ቢያንስ አንዴ ተከናዉነዉ ነበር ?

ተ.ቁ	የተከናወነዉ የአገልግሎት ዓይነት	ባለፈዉ ሶስት ወር ተከናዉኗል	ባለፈዉ 12 ወር ተከናዉኗል	አዉ-አሁን በመገልገያ ዕቃዎች/መድሀኒቶች አሉ	ባለፈዉ 3 ወር ያልተሰራበት ምክንያት?ከተች ይምረጡ
2.1	በደም ሥር የሚሰጡ በሽታ አምጪ በተለይ ባክቴሪያን የሚቆጣጠሩ መዲሀኒቶች	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.2	በደም ሥር የሚሰጥ የማህፀን ጡንቻን ማኮማተሪያ ወይም ሚጥን የሚቀሰቅስ	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.3	በደም ሥር የሚሰጥ የሚያስተኛ መድሀኒት	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.4	የቆየ የእንግዴ ልጅ እጅ በመክተት የወጣላቸዉ	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.5	የእንግዴ ልጅ ቅሪት የወጣላቸዉ	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.6	በማዋለጃ መሣሪያዎች በመታገዝ የወለዱ	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.7	ልጁ ከተወለደ በኃላ የሚሰጥ እንክብካቤ	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.8	የደም ልገሳ የተደረገላቸዉ	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.9	በቀዶ ጥገና የወለዱ እናቶች	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	
2.10	ማህፀናቸው የተጠረገላቸው እናቶች	€ አዉ € አይደለም	€ አዉ € አይደለም	€ አዉ € አይደለም	

ባለፈዉ 3 ወር ያልተሰራበት ምክንያት --ለምን?

ሀ. የስልጠና ማነስ ለ. መገልገያ መሣሪያ መድሀኒት እጥረት ሐ. የአስተዳደራዊ ችግር

መ.የለም ሠ. አይታወቅም

3. ለእያንዳንዱ የጤና ተቋማት፡-

ተ.ቁ	የአገልግሎቱ ዓይነት	2002ዓ.ም	2001ዓ.ም	2000ዓ.ም	
3.1	የጤና ተቋሙን አገልግሎት የሚጠቀመዉ የህዝብ ብዛት				
3.2	የጤና ተቋሙን አገልግሎት የሚጠቀመዉ ህዝብ ዉስጥ የሚጠበቀዉ የወሊድ ብዛት (ቁጥር)				
3.3	አጠቃላይ አገልግሎቱን የተጠቀሙ እናቶች ብዛት				
3.4	አጠቃላይ የዉልደት ብዛት በድንገት በመሣሪያ አና የቀዶ ጥገና ወሊድን ጨምሮ(በህይወት ፡ሞተዉ የተወለዱ)				
3.5	በቀዶ ጥገና የወለዱ				
3.6	ከወሊድና እርግዝና ጋር በተያያዘ የሞቱ እናቶች				
3.7	ሞተዉ የተወለዱ				
3.8	ከተወለዱት ዉስጥ 28 ቀን ሳይሞላቸዉ የሞቱ ህፃናት				
3.9	ወደ ከፍተኛ የጤና ተቋማት የተላኩ እናቶች				

4. በጤና ድርጅት ዉስጥ የሚገኙ የጤና ባለሙያ ብዛት

ተ.ቁ			ባለፈዉ 3 ወር	ባለፈዉ 1 ዓመት ዉስጥ	24 ሰዓት አገልግሎት ይሰጣሉ?አዎ/አይደለም
4.1	ዶክተር (አስፐሻሊስት)				
4.2	ጤና መኮንን				
4.3	ነርስ	ድግር			
		ድፕሎማ			
4.4	አዋለጅ ነርስ				
4.5	ማደንዘዣ ሰጭ ነርስ				
4.6	አጠቃላይ				

5.የተወሳሰቡ ከወሊድና እርግዝና ጋር የተያያዙ ክስተቶች እና የእናት ሞት በአንድ አመት ዉስጥ ያለዉን ቁጥር

ተ.ቁ	የተወሳሰቡ ከወሊድና እርግዝና ጋር የተያያዙ ክስተቶች		ወር											አጠቃላይ
		ሀምሌ 2001	ነሀሴ	መስከረም 2002	ጥቅምት	ህዳር	ታህሳስ	ጥር	የካቲት	መጋቢት	ሚያዝያ	ግንቦት	ሰኔ 2002	
5.1	ከ28 የእርግዝና ሳምንታት በኃላ የደም መፍሰስ ሲኖር													
5.2	ከወለዱ ጀምሮ ያለዉ የደም መፍሰስ													
5.3	ሚጥ ከ24 ሰዓት በላይ ሲቆይ													
5.4	ሚጥ እያለ ወይም የማህፀን ጡንቻዎች እየተኮማተሩ ህፃኑ መዉጣት ሳይችል ሲቀር													
5.5	ከወሊድ በኃላ የትኩሳት መኖር በብልት ፈሳሽ መኖር													
5.6	ዉርጃን ተከትሎ የሚመጡ ጉዳቶች													
5.7	በእርግዝና ወቅት የተረጋገጡ የደም ግፊት መጨመር													
5.8	ከማህፀን ዉጭ የተከሰተእርግዝና													
5.9	የተቀደደ ማህፀን													
5.10	ሌላ ተጨማሪ													

6. የእናቶች ሞት (ከተወሳሰቡ ከወሊድና እርግዝና ጋር የተያያዙ ክስተቶች ውስጥ የእናት ሞት በአንድ አመት ዉስጥ ያለዉን ቁጥር)

ተ.ቁ	ከተወሳሰቡ ከወሊድና እርግዝና ጋር የተያያዙ ክስተቶች ውስጥ የእናቶች ሞት		ወር												አጠቃላይ
		ሀምሌ 2001	ሃሌ	መስከረ ም2002	ጥቅምት	ህዳር	ታህሳስ	ጥር	የካቲት	መጋቢት	ሚያዝያ	ግንቦት	ሰኔ 2002		
6.1	ከ28 የእርግዝና ሳምንታት በኃላ የደም መፍሰስ ሲኖር														
6.2	ከወለዱ ጀምሮ ያለዉ የደም መፍሰስ														
6.3	ሚጥ ከ24 ሰዓት በላይ ሲቆይ														
6.4	ሚጥ እያለ ወይም የማህፀን ጡንቻዎች እየተኮማተሩ ህፃኑ መዉጣት ሳይችል ሲቀር														
6.5	ከወሊድ በኃላ የትኩሳት መኖር በብልት ፈሳሽ መኖር														
6.6	ዉርጃን ተከትሎ የሚመጡ ጉዳቶች														
6.7	በእርግዝና ወቅት የተረጋገጡ የደም ግፊት መጨመር														
6.8	ከማህፀን ዉጭ የተከሰተ እርግዝና														
6.9	የተቀደደ ማህፀን														
6.10	ሌላ ተጨማሪ														

7. ምን ዓይነት የመረጃ ምንጭ በመጠቀም ነዉ ይህንን መጠየቅ ሚሚላት የቻልከዉ

ሀ. ከእናቶች መዝገብ ሐ. አጠቃላይ ከታካሚ መዝገብ

ለ. ከማዋለጃ መዝገብ መ. ከኦፐራሶን ክፍል መዝገብ

ሠ. ከሌሎች----------

8. በአንተ አስተያየት ከተለያዩ ቦታዎች መረጃ እንዳገኘሽዉ በምን ያህል መጠን ከወሊድና/ከእርግዝና ጋር በተያያዙ ችግሮች ዉስጥ ያሉት እናቶች እርዳታ ያገኙት ተመዝግበዋል?

ሀ. አልተመዘገቡም ለ.ጥቂት ሐ.አብዛኛዉ መ.ሁሉም

9. በአንተ አስተያየት ከተለያዩ ቦታዎች መረጃ እንዳገኘሽዉ ምን ያህል የእናቶች ሞት በዚህ ጤና ጣቢያ አንደተከሰተ በመዝገብ ላይ ተመዝግቧል?

ሀ. አልተመዘቡም ለ.ጥቂት ሐ.አብዛኛዉ መ.ሁሉም

መረጃ ሰብሳቢዉ ስም----------

ስለትብብሮ በጣም አናመሰግናለን!

12. Declaration

I, the undersigned declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health. I also declare that it has never been presented in this or any other university and that all resources and materials used in the thesis have been duly acknowledged.

Name _____Meseret Girma_____

Signature_____

Place: Addis Ababa, Ethiopia

Date of Submission_____

This thesis has been submitted for examination with my approval as a university Advisor.

Name ___Ewenat Gebrehanna_____

Signature_____

Date of submission _____